

REMARKS

Reconsideration of the above-identified application in view of the following remarks is respectfully requested.

A. Status of the Claims And Explanation Of Amendments

Claims 1-10, 12, 14-15, 17-18 are pending. Claims 1-7, 14 and 17 were rejected under 35 U.S.C. § 103(a) as allegedly being unpatentable over U.S. Patent No. 5,636,003 to Tanitsu et al. ("Tanitsu") in view of U.S. Patent No. 4,918,583 to Kudo et al. ("Kudo"). Claims 8-10, 12, 15 and 18 were rejected under 35 U.S.C. § 103(a) as allegedly being unpatentable over Tanitsu in view of Kudo and further in view of applicants' admitted art.

By this paper, claims 1, 12, 14, 15, 17 and 18 have been amended. Claims 1, 14 and 17 were amended to recite the "image-forming optical system" is "for arranging a portion of exit" instead of the portion of incidence. Claims 12, 15 and 18 were amended to recite "a zoom optical system for arranging a portion of exit of said inner-surface reflecting type integrator approximately conjugate with a portion of incidence of said wave-front splitting type integrator." In addition, claims 1, 14 and 17 were amended to recite "said inner-surface reflecting type integrator" instead of "beam mixer." Support for these amendments is found throughout the application. No new matter will be added to this application by entry of these amendments. Entry is requested pursuant to 37 CFR § 1.116 as being directed to matters of form and/or simplifying matters for appeal.

B. Claims 1-10, 12, 14-15 And 17-18 Are Patentably Distinct From Tanitsu In View Of Kudo, And Further In View Of "Applicants Admitted Prior Art"

The rejection of claims 1-10, 12, 14-15 and 17-18 is respectfully traversed. Applicants review of the cited reference finds that all of the claim elements recited in the

pending claims are not found in the cited references. Accordingly, a rejection pursuant to 35 U.S.C. § 103(a) is improper and should be withdrawn.

Specifically, for example, Applicants' claim 1 recites:

1. An illumination apparatus comprising:

an inner-surface reflecting type integrator;

an optical system for directing a beam from a light source to a portion of incidence of said inner-surface reflecting type integrator;

an wave-front splitting type integrator;

an image-forming optical system for arranging a portion of exit of said inner-surface reflecting type integrator approximately conjugate with a portion of incidence of said wave-front splitting type integrator, and for directing a beam from said inner-surface reflecting type integrator to said wave-front splitting type integrator; and

an irradiating optical system for superimposing multiple beams from said wave-front splitting type integrator on a plane to be irradiated,

wherein a stop is provided at or near the portion of exit of said inner-surface reflecting type integrator.

As explained below, an aspect of the claimed invention that is not shown in the cited references is that the stop of the cited references is not approximately conjugate with the portion of incidence of the wave-front integrator.

Tanitsu is directed to an illumination optical system that comprises an optical integrator 142 and an optical integrator 162, and arranging a stop 155 provided at the exit of the optical integrator 142. *See, e.g.*, Fig. 33, and Col. 21, ln. 31 – Col. 22, ln. 59. Exit plane (E₄₂) of the optical integrator 142 is not approximately conjugate with a plane of incidence (F₄₃) of the optical integrator 162. Stop 155 is not arranged at a portion conjugate with the plane of incidence of the optical integrator 162. Accordingly, Tanitsu does not teach, disclose or suggest

“an image-forming optical system for arranging a portion of exit of said inner-surface reflecting type integrator approximately conjugate with a portion of incidence of said wave-front splitting type integrator” and “a stop is provided at or near the portion of exit of said inner-surface reflecting type integrator” as recited in Applicants claim 1.

Kudo is directed to an illuminating optical device that comprises a square-pillar-like internal reflection type integrator (10) as a first optical integrator and using a fly-eye type integrator (7) as a second optical integrator. *See, e.g.,* Fig. 1. A light source (1) emits a light flux that is reflected by an elliptical mirror (2) so that it enters the square-pillar-like internal reflection type integrator (10) at an entrance surface (A1). The light flux emerges at exit surface (B1) from the square-pillar-like internal reflection type integrator (10) as if a number of light sources were present on a plane near the entrance surface (A1). Kudo discloses that the exit surface (B1) of the square-pillar-like internal reflection type integrator (10) and the entrance surface (B2) of the fly-eye type integrator (7) are in conjugate relation with each other. (Col. 5, lns. 53-57).

In addition, Kudo discloses the use of two stops with his optical device. A first variable stop (D1) may be:

- near the exit surface A3 of the fly-eye type integrator 7 [(Col. 6, lns. 65-66)];
- on a surface A4 conjugate with the light source which is between the positive lens 23 and the condenser lens 9 [(Col. 8, lns. 1-3)]; or
- the surface A3 between a positive lens 14 and a condenser lens 15 [(Col. 12, lns. 17-20)].

A second variable stop (D2) may be:

- on the exit surface A2 of the fly-eye type integrator 4 [(Col. 7, lns. 2-4; Col. 8, lns. 4-6)];
- on the entrance surface A3 of the internal reflection type integrator 10 [(Col. 8, lns. 7-8)];
- on a surface A1 on which a group of condensing points is formed by the fly-eye type integrator 50 [(Col. 12, lns. 20-23); or
- near the entrance surface A2 of the hollow square-pillar-like internal reflection type integrator 20 [(Col. 12, lns. 23-25)].

However, Kudo – like Tanitsu – does not teach, disclose or suggest “an image-forming optical system for arranging a portion of exit of said inner-surface reflecting type integrator approximately conjugate with a portion of incidence of said wave-front splitting type integrator” and “a stop is provided at or near the portion of exit of said inner-surface reflecting type integrator” as recited in Applicants claim 1.

The Office Action does not allege that “applicants admitted prior art” should the above feature. Accordingly, independent claim 1, and independent claims 12, 14, 15, 17 and 18 and their dependent claims 2-10 are respectfully asserted to be patentably distinguished over the cited references.

CONCLUSION

For the above-stated reasons, this application is respectfully asserted to be in condition for allowance. An early and favorable examination on the merits is requested. In the event that a telephone conference would facilitate the examination of this application in any way, the Examiner is invited to contact the undersigned at the number provided.

Appl. No. 10/656,660

Paper dated May 18, 2004

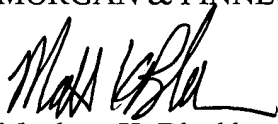
Reply to Office Action dated February 18, 2004

THE COMMISSIONER IS HEREBY AUTHORIZED TO CHARGE ANY ADDITIONAL FEES WHICH MAY BE REQUIRED FOR THE TIMELY CONSIDERATION OF THIS AMENDMENT UNDER 37 C.F.R. §§ 1.16 AND 1.17, OR CREDIT ANY OVERPAYMENT TO DEPOSIT ACCOUNT NO. 13-4500, ORDER NO. 1232-4810US1.

Respectfully submitted,
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